

Event Sequence Diagram

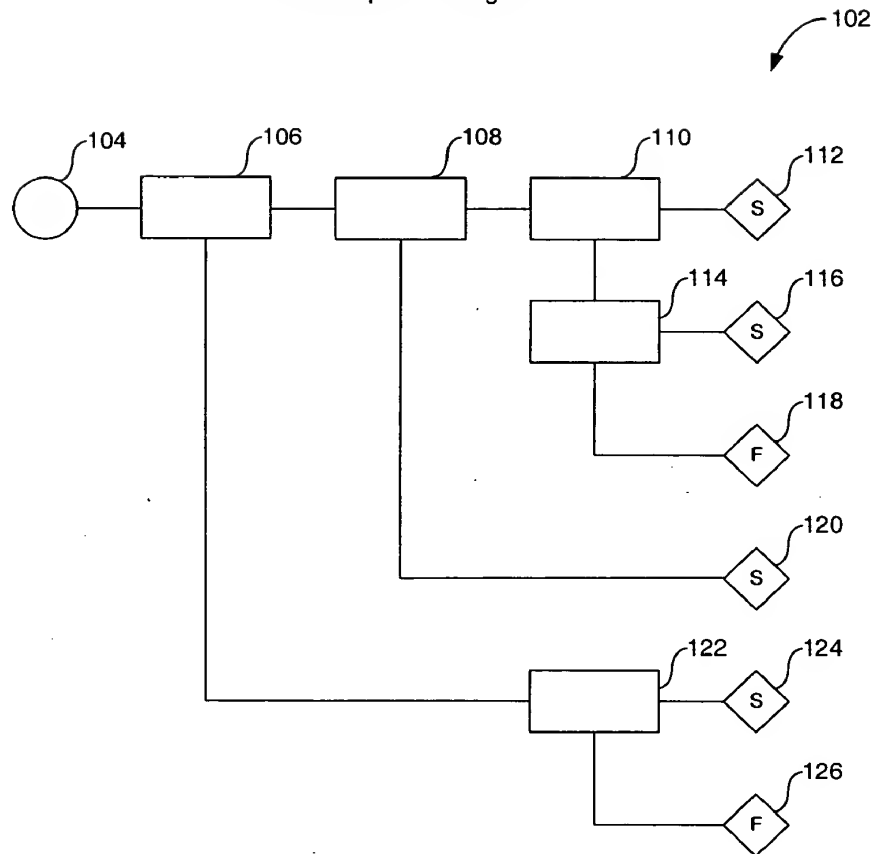


FIG. 1
(Conventional)

Fault Trees

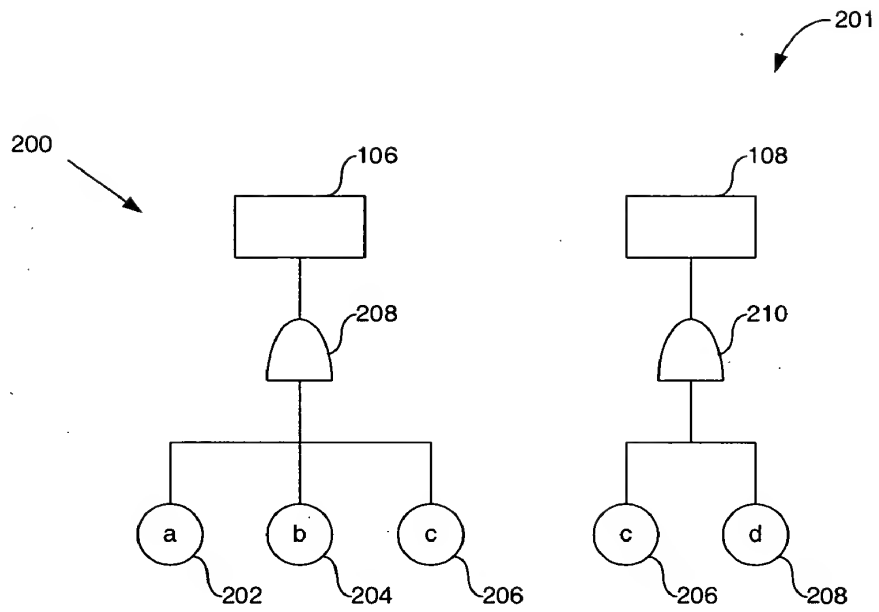


FIG. 2
(Conventional)

FIG. 3 is a block diagram of a system 300 for fault tree analysis. The system 300 includes a Graphical User Interface (GUI) 302, a Common Cause Group Definer 304, a Fault Tree Structure Module 308, a Rule Expansion Module 310, and a central processing unit 306. The central processing unit 306 contains a Fault Tree Definitions Segment 314, a Common Cause Group Definitions Segment, and a Memory component. The GUI 302 is connected to the Common Cause Group Definer 304, the Fault Tree Structure Module 308, and the Rule Expansion Module 310. The Common Cause Group Definer 304 is connected to the Fault Tree Definitions Segment 314. The Fault Tree Structure Module 308 is connected to the Common Cause Group Definitions Segment and the Rule Expansion Module 310. The Rule Expansion Module 310 is connected to the Memory component. The system 300 is enclosed in a dashed box 312.

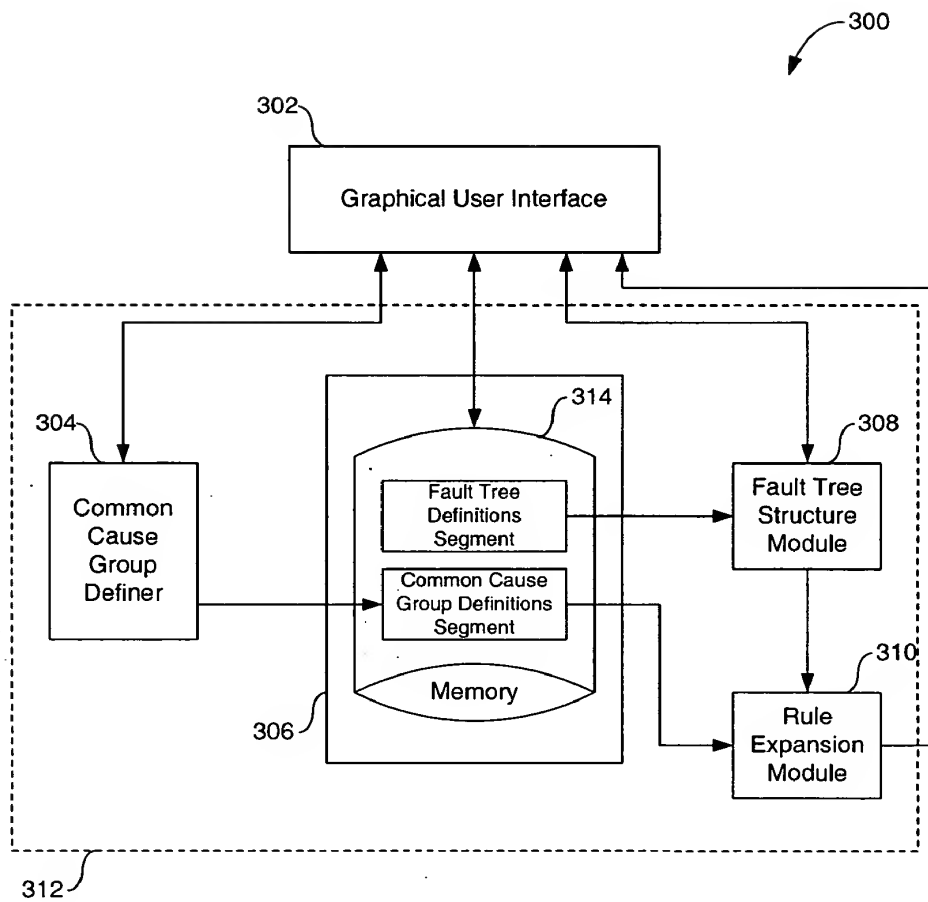


FIG. 3

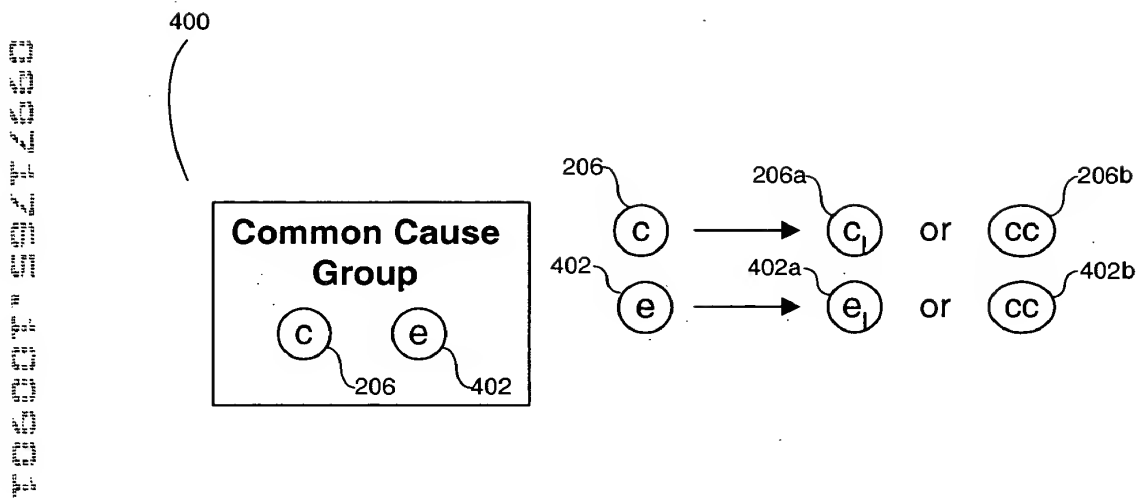


FIG. 4

FIG. 5 is a screenshot of a software interface for managing Common Cause Groups (CCGs). The interface includes a table with columns for ESD ID, DESIGNATOR, NAME, and DESCRIPTION. A specific entry is highlighted, showing ESD ID 21, DESIGNATOR CCF-001A1, NAME CCF-001A1 (A.B.D full exp), and DESCRIPTION. The interface also features a search bar, a filter dropdown, and buttons for New, Edit, and Delete. A 'Close' button is located at the bottom right.

500

502

Common Cause Group Selection Dialog

ESD Designator: 21

ESD ID	DESIGNATOR	NAME	DESCRIPTION
21	CCF-001A1	CCF-001A1 (A.B.D full exp)	

CCG Filter: ☒ This ESD ☐ All

New Edit Delete

Close

504

506

FIG. 5

CCG Designator: NewCCG CCG Name: NewCCG

600

602

Create/Edit CCF Group

CCG Designator: NewCCG

CCG Name: NewCCG

Description:

Member Basic Events:

Available Basic Events

Designator	Name	Description
A5	FULL-001A-IE	
A5	FULL-001B-IE	
A6	FULL-001B-IE	
A6	FULL-001A-IE	
B	CCF-002A2-IE	
B	CCF-002B1-IE	
B	CCF-001B2-IE	
B	CCF-002B2-IE	
B	002B-B	
B	CCF-003A-IE-E	

→ ←

Designator	Name	Description
C	CCF-001A1-IE-C	
B	CCF-001A2-IE-C	

→ ←

Next

Exp

604

606

608

FIG. 6

CCF - Expansion

700

702

704

706

708

710

606

CCF Designator: NewCCG

CCG Name: NewCCG

Description:

Member Basic Events

Designator	Name
C	CCF-001A1-IE-C
B	CCF-001A2-IE-B

Expansion of the selected basic event to CCFs

Common Cause Events Type

Global Expansion (Beta Factor Model)

Full Expansion (Alpha Factor Model)

Designator	Name
C(1)	CCF-001A1-IE-C-indiv.
CC3(2)	CCF-C.8

Default

Delete

Back

Next

Exit

FIG. 7

800

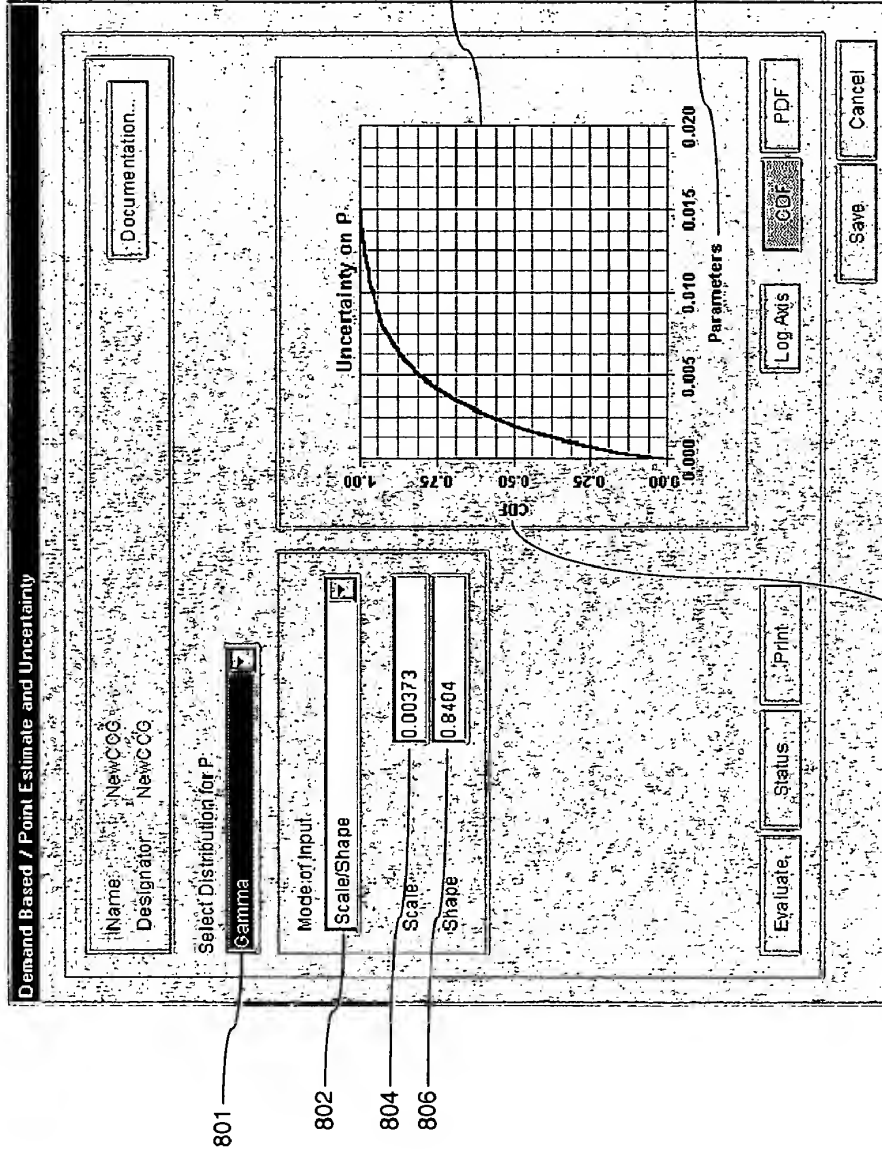


FIG. 8

FIG. 9 is a screenshot of a software interface for defining CCG (Common Cause Group) parameters. The interface includes a title bar, a menu bar, and a main window with several sections: CCG Designator, Description, CCG Type, Full Expansion, Factors, Alpha Factor, and Matching CCGs. The Factors section contains a table with columns for Factor, Param. A, Param. B, Mean Value, 5th, and 95th. The Alpha Factor section contains a table with columns for Alpha 1, Alpha 2, and Alpha Factor. The Matching CCGs section contains a table with columns for Designator and Name. The interface also includes buttons for New CCG, Back, Finish, and Exit, and a Probability field.

900

Q CCF - Quantification Parameters

904 906 908 910 912

CCG Designator: NewCCG

Description:

CCG Type: Full Expansion

CCG quantification determined by:

Factors

Factor	Param. A	Param. B	Mean Value	5th	95th
Alpha1	2.1	.4	8.400E-1	4.053E-1	9.998E-1
Alpha2	.03				

Alpha Factor

Alpha Factor

Matching CCGs:

Designator	Name
C(1)	CCF-001A1-IE-C-indiv
B(1)	CCF-001A2-IE-B-indiv

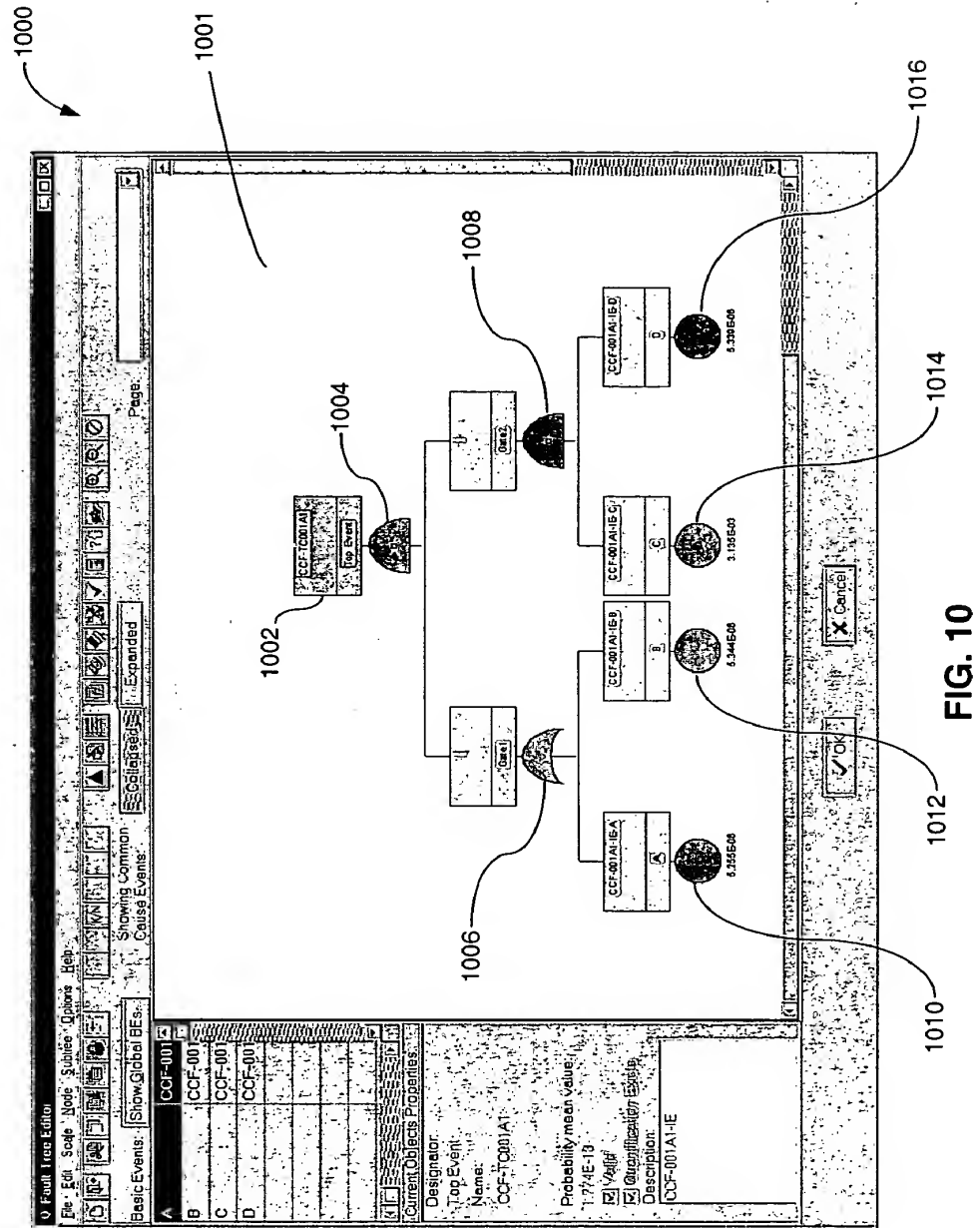
Number of member basic events: 2

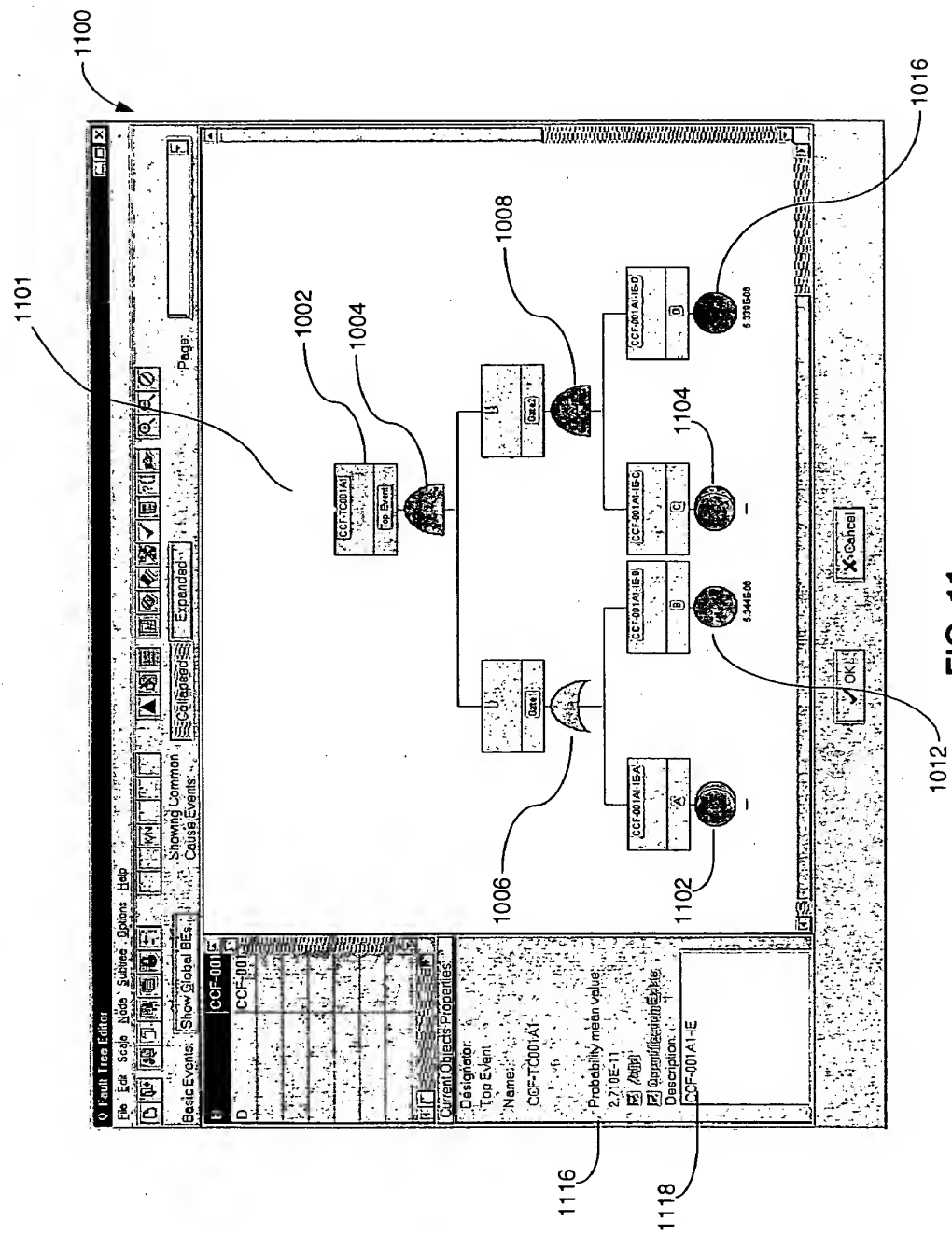
Number of simultaneous events: 1

Probability:

Back Finish Exit

FIG. 9





"Name" field is for identifying the event, and "Description" field is for describing the event. The "Probability mean value" field is for entering the mean value of the probability distribution. The "Variance" field is for entering the variance of the probability distribution. The "Designator" field is for entering the designator of the event. The "Top Event" field is for entering the top event of the event. The "Current Object Properties" field is for entering the current object properties of the event.

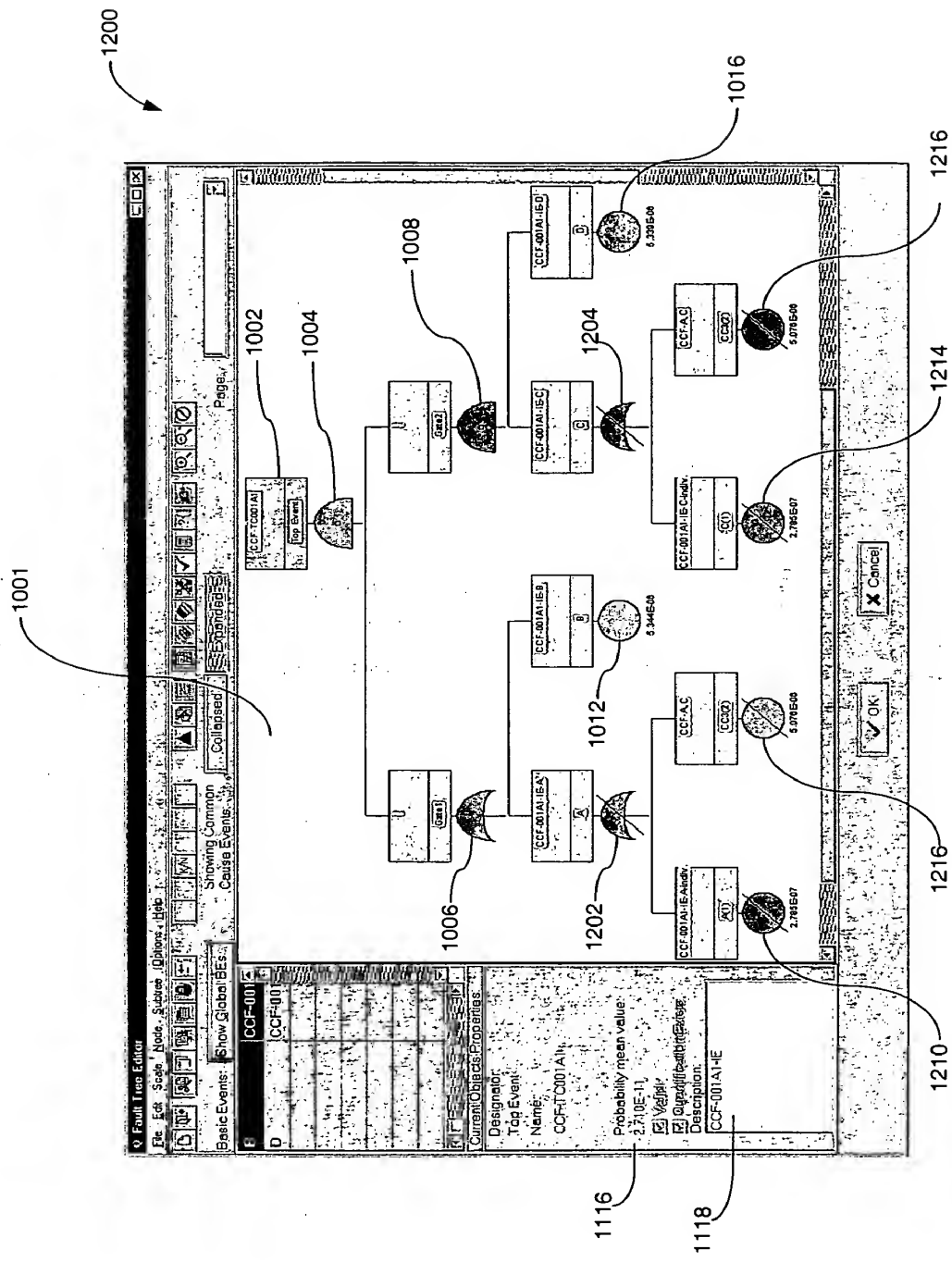


FIG. 12